

AMENDMENTS TO THE CLAIMS

Please amend claims 1 and 8. Please cancel claims 5 and 44 without prejudice to pursuing these claims in a continuation or other application.

1. (Currently Amended) A processing apparatus for processing a microelectronic workpiece, comprising:

an in-line metrology unit having a space for receiving a microelectronic workpiece for measuring a condition of a first layer on the microelectronic workpiece and generating a condition signal;

a control, signal-connected to the metrology unit;

a process unit providing a space to receive the microelectronic workpiece and performing an electrochemical process that is controlled by the control, wherein the process unit comprises an electroplating reactor having at least one anode and a workpiece holder to hold the microelectronic workpiece as cathode, and wherein the process is dependent on the current between the anode and the cathode, and wherein the control adjusts the current in response to the condition signal; and

a transport unit positioned to receive the microelectronic workpiece from at least one of the process unit and the in-line metrology unit and move the microelectronic workpiece to the other of the process unit and the in-line metrology unit,

wherein the condition signal from the metrology unit to the control influences said process, and is representative of a thickness of a seed layer applied onto the microelectronic workpiece.

2. (Previously Presented) The apparatus according to claim 1, further comprising a non-compliance unit, and wherein the transport unit is signal-connected to the control, further wherein the condition signal from the metrology unit influences the

control to cause the transport unit to transfer the microelectronic workpiece to the noncompliance unit.

3. (Previously Presented) The apparatus according to claim 1, wherein the first layer comprises a seed layer, and wherein the process unit includes a seed layer enhancement unit, and wherein the transport unit is signal-connected to the control, wherein the condition signal from the metrology unit influences said control to cause the transport unit to transport a microelectronic workpiece to the seed layer enhancement unit.

4. (Cancelled)

5. (Cancelled)

6. (Previously Presented) The apparatus according to claim 1, wherein the electroplating reactor comprises a plurality of anodes and the control adjusts current between each anode and the cathode.

7. (Previously Presented) The apparatus according to claim 1, wherein the process unit comprises a chemical mechanical polishing tool.

8. (Currently Amended) A processing apparatus for processing a microelectronic workpiece, comprising:

an in-line metrology unit having a space for receiving a microelectronic workpiece for measuring a condition of a first layer on the microelectronic workpiece and generating a condition signal, wherein the metrology unit is configured to measure a thickness of a seed layer and measure a thickness of a process layer deposited on the seed layer;

a control, signal-connected to the metrology unit;

a process unit providing a space to receive the microelectronic workpiece and performing an electrochemical process that is controlled by the control, wherein the process unit comprises a chemical mechanical polishing tool, and the first layer comprises a layer on the workpiece just prior to chemical mechanical polishing by the chemical mechanical polishing tool.

9. (Previously Presented) The apparatus according to claim 1, wherein the process unit comprises a chemical mechanical polishing tool, and the first layer comprises a layer on the workpiece just after chemical mechanical polishing by the chemical mechanical polishing tool.

10. (Previously Presented) A processing apparatus for processing a microelectronic workpiece, comprising:

an in-line metrology unit having a space for receiving a microelectronic workpiece for measuring a condition of a first layer on the microelectronic workpiece and generating a condition signal, wherein the metrology unit is configured to measure a thickness of a seed layer and measure a thickness of a process layer deposited on the seed layer;

a control, signal-connected to the metrology unit;

a process unit providing a space to receive the microelectronic workpiece and performing an electrochemical process that is controlled by the control; and

a transport unit positioned to receive the microelectronic workpiece from at least one of the process unit and the in-line metrology unit and move the microelectronic workpiece to the other of the process unit and the in-line metrology unit,

wherein the condition signal from the metrology unit to the control influences the process.

11-26. (Cancelled)

27. (Previously Presented) An apparatus for processing a microelectronic workpiece, comprising:

- a metrology unit having a space for receiving a microelectronic workpiece, the metrology unit being configured to measure a condition of at least one conductive layer of the microelectronic workpiece and generate a condition signal representative of the condition, wherein the at least one conductive layer includes a generally continuous seed layer and wherein the metrology unit is configured to generate a condition signal representative of a thickness of the seed layer;
- an electrochemical processing unit having a space to receive the microelectronic workpiece, the electrochemical processing unit being configured to apply a conductive material to the at least one conductive layer; and
- a control unit operatively coupled between the metrology unit and the electrochemical processing unit to receive the condition signal from the metrology unit and transmit a control signal, the control signal influencing at least one of a manner in which the conductive material is applied to the at least one conductive layer of the microelectronic workpiece and a sequence of processes performed on the microelectronic workpiece.

28. (Cancelled)

29. (Previously Presented) The apparatus of claim 27, further comprising a material deposition unit configured to apply the at least one conductive layer to the microelectronic workpiece.

30. (Previously Presented) The apparatus of claim 27 wherein the metrology unit is configured to detect a condition of the at least one conductive layer, with the at least one conductive layer applied to the microelectronic workpiece external to the apparatus.

31. (Previously Presented) The apparatus of claim 27 wherein the electrochemical processing unit has a plurality of electrodes and wherein the control unit is operatively to the electrodes to control a current applied to at least one of the electrodes based on the condition signal.

32. (Previously Presented) The apparatus of claim 27 wherein the metrology unit and the electrochemical processing unit are housed in a single tool.

33. (Previously Presented) The apparatus of claim 27 wherein the metrology unit and the electrochemical processing unit are virtually coupled.

34. (Previously Presented) The apparatus of claim 27 wherein the metrology unit and the electrochemical processing unit are housed in separate tools.

35. (Previously Presented) The apparatus of claim 27 wherein the control signal influences a uniformity with which the conductive material is applied.

36. (Previously Presented) An apparatus for processing a microelectronic workpiece, comprising:

- a metrology unit having a space for receiving a microelectronic workpiece, the metrology unit being configured to measure a condition of at least one conductive layer of the microelectronic workpiece and generate a condition signal representative of the condition, wherein the at least one conductive layer includes a generally continuous seed layer and wherein the metrology unit is configured to generate a condition signal representative of a thickness of the seed layer;

- a processing unit having a space to receive the microelectronic workpiece, the processing unit being configured to perform a process on the at least one

conductive layer of the microelectronic workpiece, the process including at least one of a repair process and an enhancement process; and
a control unit operatively coupled between the metrology unit and the processing unit to receive the condition signal from the metrology unit and transmit a control signal to the processing unit to influence at least in part the process performed by the processing unit.

37. (Cancelled)

38. (Previously Presented) The apparatus of claim 36, further comprising a material deposition unit configured to apply the at least one conductive layer to the microelectronic workpiece.

39. (Previously Presented) The apparatus of claim 36 wherein the metrology unit is configured to detect a condition of the at least one conductive layer, with the at least one conductive layer applied to the microelectronic workpiece external to the apparatus.

40. (Previously Presented) The apparatus of claim 36 wherein the electrochemical processing unit has a plurality of electrodes and wherein the control unit is operatively to the electrodes to control a current applied to at least one of the electrodes based on the condition signal.

41. (Previously Presented) The apparatus of claim 36 wherein the metrology unit and the electrochemical processing unit are housed in a single tool.

42. (Previously Presented) The apparatus of claim 36 wherein the metrology unit and the electrochemical processing unit are virtually coupled.

43. (Previously Presented) The apparatus according to claim 8, further comprising a non-compliance unit, and wherein the transport unit is signal-connected to the control, further wherein the condition signal from the metrology unit influences the control to cause the transport unit to transfer the microelectronic workpiece to the noncompliance unit.

44. (Cancelled)

45. (Previously Presented) The apparatus according to claim 10, further comprising a non-compliance unit, and wherein the transport unit is signal-connected to the control, further wherein the condition signal from the metrology unit influences the control to cause the transport unit to transfer the microelectronic workpiece to the noncompliance unit.

46. (Previously Presented) The apparatus according to claim 10, wherein the first layer comprises a seed layer, and wherein the process unit includes a seed layer enhancement unit, and wherein the transport unit is signal-connected to the control, wherein the condition signal from the metrology unit influences the control to cause the transport unit to transport a microelectronic workpiece to the seed layer enhancement unit.

47. (Previously Presented) The apparatus according to claim 10, wherein the process unit comprises an electroplating reactor having at least one anode and a workpiece holder to hold a microelectronic workpiece as cathode, and the process is dependent on the current between the anode and the cathode, the control adjusting the current in response to the condition signal.

48. (Previously Presented) The apparatus according to claim 47, wherein the condition signal is representative of a thickness of a seed layer applied onto the microelectronic workpiece.

49. (Previously Presented) The apparatus according to claim 47, wherein the electroplating reactor comprises a plurality of anodes and the control adjusts current between each anode and the cathode.

50. (Previously Presented) The apparatus according to claim 10, wherein the process unit comprises a chemical mechanical polishing tool.

51. (Previously Presented) The apparatus according to claim 10, wherein the process unit comprises a chemical mechanical polishing tool, and the first layer comprises a layer on the workpiece just prior to chemical mechanical polishing by the chemical mechanical polishing tool.

52. (Previously Presented) The apparatus according to claim 10, wherein the process unit comprises a chemical mechanical polishing tool, and the first layer comprises a layer on the workpiece just after chemical mechanical polishing by the chemical mechanical polishing tool.